

Title (en)

Novel phosphonamides - synthesis and flame retardant applications

Title (de)

Neuartige Phosphoramide - Synthese und flammhemmende Anwendungen

Title (fr)

Nouveaux phosphonamides - synthèse et applications ignifuges

Publication

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Application

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Priority

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Abstract (en)

The invention relates to a group of novel compounds containing one or more amino substituted DOPO (9,10-dihydro-9-oxa-phosphaphenthren-10-oxide) moieties. The compounds were found to have good flame retardant properties and also good thermal stability, which makes them particularly suitable as flame retardant additives for various thermoplastic polymers. In particular, they can be incorporated in a flexible polyurethane foam.

IPC 8 full level

C07F 9/6571 (2006.01); **C09K 21/12** (2006.01)

CPC (source: EP US)

C07F 9/6571B1 (2013.01 - EP US); **C08J 9/0038** (2013.01 - US); **C08K 5/5399** (2013.01 - EP US); **C08K 5/544** (2013.01 - EP US);
C09K 21/12 (2013.01 - EP US); **C08J 2375/04** (2013.01 - US); **C08K 5/0066** (2013.01 - EP)

C-Set (source: EP US)

EP

1. **C08K 5/5399 + C08L 75/04**

2. **C08K 5/544 + C08L 75/04**

US

C08K 5/544 + C08L 75/04

Citation (applicant)

- EP 1889878 A1 20080220 - FUJI ELECTRIC HOLDINGS [JP], et al
- US 2011034717 A1 20110210 - LU LING [TW], et al
- DE 102009035301 A1 20100218 - EMS PATENT AG [CH]
- DE 19505352 A1 19960321 - BAYER AG [DE]
- US 3702878 A 19721114 - SAITO TORANOSUKE
- US 2005020739 A1 20050127 - DITTRICH UWE [DE], et al
- EP 2090618 A2 20090819 - SCHILL & SEILACHER STRUKTOL AG [DE]
- JP 2002161197 A 20020604 - SUMITOMO BAKELITE CO
- US 2010280215 A1 20101104 - JUST BERTHOLD [DE], et al
- WO 2011000457 A1 20110106 - EMS PATENT AG [CH], et al
- JP 2007091606 A 20070412 - SONGWON IND CO LTD
- KR 100199102 B1 19990615 - KOLON INC [KR]
- JP 2003105058 A 20030409 - O SHUNZAN
- CN 100999145 A 20070718 - SICHUAN DONGCAI ENTPR GROUP CO [CN]
- JP 2006328100 A 20061207 - SONGWON IND CO LTD
- WO 2006126393 A1 20061130 - FUJI ELECTRIC HOLDINGS [JP], et al
- KR 20080091036 A 20081009 - INKTEC CO LTD [KR]
- JP 2009266663 A 20091112 - MITSUI CHEMICALS INC, et al
- JP H10203028 A 19980804 - FUJI PHOTO FILM CO LTD
- AT 508468 A1 20110115 - KREMS CHEMIE CHEMICAL SERVICES AG [AT]
- LU, S.-H., HAMERTON, PROGRESS IN POLYMER SCIENCE, vol. 27, no. 8, 2002, pages 1661 - 1712
- SHIEH, J.-Y., WANG, C.-S., POLYMER, vol. 42, 2001, pages 7617
- WANG, X.-J., WANG, R.-M., YANG, J.-H., REGUXING SHUZHI, vol. 24, 2009, pages 27
- KOENIG, A., KROKE, E., FROM POLYMERS FOR ADVANCED TECHNOLOGIES, vol. 22, 2011, pages 5
- ZHAO, X., HUAXUE YANJIU YU YINGYONG, vol. 12, 2000, pages 648
- SCHAEFER, A., SEIBOLD, S., LOHSTROH, W., WALTER, O., DÖRING, M., JOURNAL OF APPLIED POLYMER SCIENCE, vol. 105, no. 2, 2007, pages 685 - 696
- BELETSKAYA, I.P., NEGANOV, E.G., VEITS, Y.A., RUSSIAN JOURNAL OF ORGANIC CHEMISTRY, vol. 40, 2004, pages 1782
- SPONTON, M., LLIGADAS, G., RONDA, J.C., GALIA', M., CADIZ, M., POLYMER DEGRADATION AND STABILITY, vol. 94, 2009, pages 1693
- KERENYI, A., BALASSA, A., KORTVELYESI, T., LUDANYI, K., KEGLEVICH, G., TRANSITION METAL CHEMISTRY, vol. 33, 2008, pages 459
- KEGLEVICH, G., SZELKE, H., KERENYI, A., KUDAR, V., HANUSZ, M., SIMON, K., IMRE, T., LUDANYI, K., TETRAHEDRON ASYMMETRY, vol. 16, no. 24, 2005, pages 4015 - 4021
- ÁBRÁNYI-BALOGH, P., KEGLEVICH, G., SYNTH. COMM., vol. 41, 2011, pages 1421 - 1426
- UJJ, V., CZUGLER, M., SCHINDLER, J., FOGASSY, E., KEGLEVICH, G., MAGYAR KEMIAI FOLYOIRAT, KEMIAI KOZLEMENYEK, vol. 116, 2010, pages 31
- RAKOTOMALALA, M, WAGNER, S., ZEVACO, T., DÖRING, M., HETEROCYCLES, vol. 83, 2011, pages 743 - 753
- GAAN, S., RUPPER, P., SALIMOVA, V., POLYMER DEGRADATION AND STABILITY, vol. 94, no. 7, 2009, pages 1125 - 1134
- DEO, H. T., PATEL, N. K., PATEL, B. K., J. OF ENGINEERED FIBERS AND FABRICS, vol. 3, no. 4, 2008, pages 23 - 38
- LEU, T.-S., WANG, C.-S. J. OF APPLIED POLYMERSCIENCE, vol. 92, no. 1, 2004, pages 410 - 417
- NGUYEN, C., KIM, J., POLYMER DEGRADATION AND STABILITY, vol. 93, 2008, pages 1037 - 1043
- LEWIN, M. J., FIRE SCIENCES, vol. 17, no. 1, 1999, pages 3 - 19
- WANG, L., WU, X., WU, C., YU, J., WANG, G., JIANG, P., JOURNAL OF APPLIED POLYMER SCIENCE, vol. 121, no. 1, 2011, pages 68 - 77
- "Scientific Committee on Health and Environmental Risks, Environmental", EINECS, 2007
- GUPTA, R.: "Toxicology of Organophosphate and Carbamate compounds", 2006, ELSEVIER INC.

- [YD] EP 1889878 A1 20080220 - FUJI ELECTRIC HOLDINGS [JP], et al
- [Y] DATABASE CA [online] CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; SAITO, TORANOSUKE ET AL: "Organic phosphorus compounds, fireproofing agents therefrom, and flame-retardant polymer compositions therewith", XP002667449, retrieved from STN Database accession no. 2007:401571 & JP 2007091606 A 20070412 - SONGWON IND CO LTD

Cited by

CN103833947A; CN109251296A; CN110643066A; CN113773502A; KR20210029993A; WO2021023230A1; EP2921498A1; US10072212B2; EP3421479A1; WO2019002201A1

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JP 2014528396 A 20141027; JP 6082393 B2 20170215; KR 101783664 B1 20171106; KR 20140117342 A 20141007;
MX 2014001547 A 20150320; MX 347867 B 20170517; PL 2557085 T3 20150430; SG 2014012769 A 20141030; US 2014343183 A1 20141120;
US 9650497 B2 20170516; WO 2013020696 A2 20130214; WO 2013020696 A3 20130510

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MX 2014001547 A 20120806; PL 11176861 T 20110808; SG 2014012769 A 20120806; US 201214237284 A 20120806